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ABSTRACT

Outlined in this guide is an approach to the teaching of environmental conservation as an integral part of all subjects in the elementary school curriculum. It stresses the relationship between man and his physical-biological environment in a social-cultural context. Field study is encouraged while emphasis is given to providing opportunities for pupils to use deductive and inductive reasoning. It also advocates individualized instruction, problem solving, and the use of a variety of learning materials in different situations. Organized by grade levels and with a major theme for each level, the outline gives special attention to reinforcing generalizations developed at earlier grade levels. Under each grade level are three main divisions: (1) Objectives, (2) Things To Talk About, and (3) Things To Do. The latter two contain suggestions for teacher-pupil discussion and activities. The outline also includes information about how to obtain Soil Conservation Service (SCS) publications and how to locate audiovisual teaching aids, a list of SCS publications, and reading lists for elementary school children, teachers, and advanced students. Recommended for use with this outline is "Teaching Soil and Water Conservation--A Classroom and Field Guide," SE 009 291. (BL)

ED 067225

AN OUTLINE FOR TEACHING CONSERVATION IN ELEMENTARY SCHOOLS

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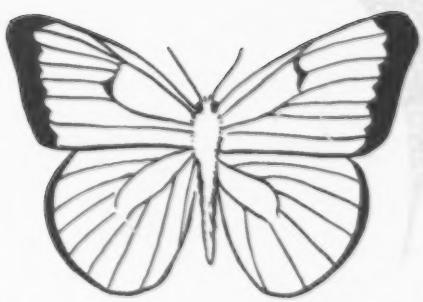

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Introduction

This outline suggests an approach to the teaching of environmental conservation as an integral part of all subjects in the elementary school curriculum. Environmental conservation education is not a single or a separate subject. It is a synthesis of knowledge from many disciplines and deals with the relationship between man and his physical-biological environment in a social-cultural context.

Because of the differences in educational organization and the variety of local environmental management problems, this outline is designed so that teachers can adapt its suggestions to their own classrooms and local conditions. The general objectives are intended as guides to the preparation of specific behavioral objectives by each teacher in organizing and evaluating an environmental conservation education program.

Field study develops sensitivity, awareness, and knowledge and is thus a prerequisite to intelligent participation in efforts to improve the environment. In this outline emphasis is given to providing opportunities for pupils to use deductive and inductive reasoning. The outline also encourages individualized instruction, problem solving, and the use of a variety of learning materials in different situations.

Organized by grade levels and with a major theme for each level, the outline gives special attention to reinforcing generalizations developed at earlier grade levels. Under each grade level are three main divisions: (1) Objectives; (2) Things To Talk About; and (3) Things To Do. The latter two contain suggestions for teacher-pupil discussion and activities. The outline also includes information about how to obtain Soil Conservation Service (SCS) publications and how to locate audiovisual teaching aids, a list of SCS publications, and reading lists for elementary school children, teachers, and advanced students.

The SCS publication, "Teaching Soil and Water Conservation—A Classroom and Field Guide," is recommended for use with this outline. It suggests simple experiments and projects that illustrate soil and water conservation principles.

Washington, D.C.

Revised July 1971

AN OUTLINE FOR TEACHING CONSERVATION IN ELEMENTARY SCHOOLS

GRADE 1. Looking at the Environment

OBJECTIVES

- To develop an awareness of the immediate natural environment—plants, animals, rocks, air, water, and soil found at school, in the neighborhood, or in the community.
- To develop an awareness of change in the natural world—how sizes, shapes, colors, sounds, smells, textures, and animal activities vary with the seasons.
- To understand some of the interrelationships among soil, plants, animals, people, water, and air.
- To learn how people depend on soil, water, plants, animals, and air and why people must know how to take care of them properly.
- To learn what people can do to make their environment cleaner, more healthful, and more beautiful.

THINGS TO TALK ABOUT

What plants and animals are found at school, in the neighborhood, or in the community? Include weeds, starlings, rats, domestic animals, fish, birds, insects, earthworms, and ants. How do they affect people? How do people affect them? Begin classifying by grouping similar things.

How do the changes in seasons affect plants in the area? Animals? Soil? Water? People? What are some of the different sounds you hear on your way to school, in the outdoor classroom, and in your school hallway?

What kinds of rocks and soils are found in your neighborhood? How do people use soil? How do plants and animals depend on soil? Do plants grow better in some soils than in others? Is the soil affected by plants, animals, and people?

In what ways do plants and animals in your community depend on one another? What plants and animals do you depend on for food, shelter, and clothing? How do plants and animals depend on you?

In what ways do plants, animals, and people depend on sunshine, snow, and rain? For what purposes do we use water at school? At home? In the city? On a farm? How are water and air affected by plants, animals, people, and soil? What happens to rain and snow when they fall on the soil? On sidewalks and streets? How does snow affect people in the city? In the country?

Do we need to take care of soil, water, plants, animals, and air? Why? What are some things you can do to make your community cleaner, more healthful, and more beautiful?

THINGS TO DO

Take a walk around the school site and neighborhood or to a vacant lot or nearby park and make a list of things observed. Afterwards, draw pictures or tell stories about some of the things seen on the walk.

Keep a list or chart of things that change as the seasons change. Consider doing a yearlong mural or model to show how living things adapt and change with the seasons.

Collect samples of soil from three different locations and examine them for differences in color and texture.

Build a balanced aquarium or terrarium to learn how plants and animals depend on each other. Make a windowsill garden to learn how plants grow and how to take care of them; keep a weekly record of plant growth.

Collect seeds or leaves for a classroom display; compare their sizes, shapes, and textures. Show in the display how seeds might travel from one location to another.

Take a walk in the rain to observe how rain strikes the soil, sidewalk, grass, and trees; how soil moves with surface water; how raindrops cling to leaves; and how leaves cushion the force of raindrops, thus helping protect the soil.

Take a walk when it is snowing. Collect snow and determine how much snow it takes to make a cup of water. Find out what happens to the water when snow melts in the city and in the country.

Plan and carry out cleanup and planting projects on the school site or in the community.

GRADE 2. Change in the Natural World

OBJECTIVES

- To increase awareness of change, variety, similarities, and interrelationships within the natural environment.
- To develop an awareness of people as a part of the natural world and their role in changing the environment.
- To learn how rocks are continually being changed into soil; how soils differ; how soil is moved; and how soil can be conserved.
- To understand how the life of a plant or animal is affected by its environment.
- To understand how animals depend directly or indirectly on food from green plants for energy and growth.
- To learn more about how people depend on each other and on soil, water, plants, animals, and air.

THINGS TO TALK ABOUT

What kinds of food and clothing do we get from wildlife, domesticated animals, and plants?

How do animals such as mammals, birds, fish, and insects help man?

What objects do you use everyday? Classify them as coming from animals, plants, or minerals.

Discuss how your everyday activities affect natural resources. How do you make use of soil, trees, shrubs, flowers, water, domesticated animals, and wildlife?

How is soil made? What are the effects of wind, water, and plants on rocks? Do animals live in the soil? Are air and water found in the soil?

Discuss the differences and similarities in sand, clay, and silt. How do they compare with soil from a neighborhood garden? What makes soil in a garden good for growing plants?

What natural forces move soil? Why should we conserve soil? How do plants help hold the soil in place?

Name places where soil is washing away and discuss some of the ways to prevent soil washing.

How does the appearance of trees, flowers, water, insects, birds, wildlife, and domesticated animals change with the seasons? Which plants do not lose their leaves in winter?

How do wild animals store food for the winter? How do people store food?

Compare plants and animals living in your community with those in the ocean, in a pond, in a desert, and in a forest. How are they similar? How are they different?

How do green plants make their own food from water, air, sunlight, and minerals in the soil? Can animals and people make their own food from these raw materials? Trace some foods eaten by animals and people to green plants and the soil.

How do people who live in cities and towns depend on farmers and ranchers? How do farmers and ranchers depend on people in cities and towns? Discuss some kinds of work done by people as they make use of natural resources to produce food, shelter, and clothing.

THINGS TO DO

Keep a weekly record during the school year of the changes in a tree, a vacant lot, or a 3-foot-square area of land in your backyard.

Collect different kinds of leaves during the fall. What do they have in common? How are they different? Match the leaves with the trees they came from and sketch the shape of different trees. What happens to the leaves left on the ground?

Make some "soil" by rubbing soft stones or bricks together. Compare this material with soil from a garden or park and discuss what changes take place as the rock particles become soil.

Demonstrate that soil contains water, air, and living organisms.

Find an area near the school where water or wind has moved the soil. Develop a project showing how to keep the soil in place.

Take a walk on a windy day to observe how wind moves flags, clouds, leaves, seeds, and soil. Show how grass and shrubs keep soil from blowing.

Show how plants depend on soil, water, air, and light.

Make murals and sketches to show how items you use every day come from the soil.

Visit an industry in your community that uses natural resources in processing or making products.

Measure the amount of sediment in a jar of water taken from a stream immediately after a rainstorm and measure the amount of sediment in water taken from the same stream a week after the rainstorm. Allow the water to stand at least 24 hours before measuring and comparing the amounts of sediment found in each jar.

List ways people protect their natural resources and ways people use them carelessly.

GRADE 3. How Environments Differ

OBJECTIVES

- To understand how one natural environment differs from another natural environment.
- To learn how living things adapt to different environments.
- To understand how available natural resources influence the way people live.
- To understand how people change the environment as they use natural resources.
- To learn about different conservation practices and to understand the need for them in taking care of natural resources.

THINGS TO TALK ABOUT

What is an environment? What are some of the natural factors that limit plant and animal life in your community?

How is our environment different from the environment in which a polar bear lives? A cactus? A seagull? A fish?

Name some of the physical characteristics of plants and animals that enable them to adapt to different environments. How have people learned to adapt to different environments? Why can some animals live in several different environments?

Why are most towns and cities located along rivers or near lakes? Where does our community get its water supply?

In what ways are farmland, rangeland, forests, wildlife, and minerals important to our community?

Discuss the different purposes for which soil is used in the city and in rural areas.

In what forms have you seen water? What causes water to change form, and how do the different forms affect human activities?

How are plants, animals, soil, and water affected when man uses large areas of land for houses, shopping centers, highways, and airports?

Where does soil go when water washes it off unprotected areas?

What is sediment? How does sediment in rivers and lakes affect fish and wildlife? The water you use every day?

What are some conservation practices used by builders and farmers in your community to prevent soil from washing into rivers and lakes? Can the same practices be used by both?

THINGS TO DO

Select a plant and an animal found on the school site; explain what they need for survival and how the environment meets their needs.

Visit a nearby park, wooded area, or pond. List the plants and animals that are the same as, and those that are different from, the ones found on the school grounds. Explain the physical characteristics of the plants and animals that enable them to live where they do. Examine the soils in each place. Describe how different soils affect the plants and animals living in each area.

Build a balanced aquarium or terrarium and then change one element at a time to determine the effect on the environment.

Draw the main characteristics of forest, grassland, and desert environments; describe how they differ from each other.

Study a soil profile in a highway cut or excavation site. Identify the surface soil, subsoil, and parent material. Describe the differences in color and texture of the three layers.

Conduct an experiment to find out if soil particles are all the same size.

Compare the water running off a bare slope with water flowing from a grass-covered slope during a gentle rain. Collect a jar of water from both areas and compare the amount of sediment in each.

Visit a construction site, a subdivision, or a nearby farm where conservation practices are used.

Start a school garden with different kinds of plants. Learn how to manage soil and water resources to encourage the growth of these plants.

Keep a daily weather chart for a month. Draw pictures of the cloud formations most likely to produce rain or snow.

List the products made from natural resources in your community and used in other places.

Make a study of the school grounds and plan a conservation project to improve the environment for plants, animals, and people.

GRADE 4. Taking Care of Natural Resources

OBJECTIVES

- To understand the inorganic-organic cycles within the natural environment.
- To learn more about the ways resources are changed through use.
- To understand the water cycle and how people in different environments manage water resources.
- To understand some of the relationships among natural resources within a watershed, and how the protection and management of watersheds affect the quality of the environment.
- To learn how conservation practices can help man improve his environment, and to understand some of the choices man must make in applying such practices.

THINGS TO TALK ABOUT

What is a food chain? A food pyramid? Why does it take 2,200 pounds of plant plankton to produce 22 pounds of commercial fish that can produce a weight gain of 2 pounds in man?

How are producers, consumers, and decomposers related?

Is soil a renewable natural resource? How does soil develop? How do decomposers help return organic matter to the soil? Name some materials that do not decompose readily. Explain some methods man might use to recycle these materials.

What are the sources of oxygen on earth? In how many ways do people use oxygen? Why does the amount of oxygen on earth vary only within narrow limits?

What is a watershed? Does the way the land is used in the watershed affect water in small streams? In rivers?

What happens to water when it falls on the pavement? Rooftops? Soil? What determines how much water runs off and how much soaks into the soil? How do the different kinds and amounts of plant cover help water soak into the soil? Does water soak into frozen soil?

What happens to water once it enters the soil? Why is ground water important to plants and to people?

How does the amount of soil that washes off unprotected land into streams, rivers, and lakes affect your water supply?

Trace the history of natural resource use in your watershed and community. What plants and animals were once found there? What new plants and animals have been introduced?

What things should be considered when deciding how the water resources in your watershed are to be managed? What choices must be made? What different kinds of conservation practices might be used? Which ones are needed in our community?

THINGS TO DO

Show in a diagram, beginning with the soil, several food pyramids having at least three levels. Draw a food chain with people in it.

Study the plants and animals on and near the school site, in the outdoor classroom, in a vacant lot, in a nearby field, in the woods, and in a pond. How do the plants and animals differ in one area from those in another? How are they similar? How has man changed these areas? Prepare a report explaining how plants or animals have adapted to the environment in these areas.

Write stories about some of the ways man has either improved or harmed the environment for living things, or how your environment has changed because of man's influence.

Make a mural of the water cycle and show what happens to precipitation when it falls to earth.

Visit a cutover or burned-over forest, a building site, or subdivision where topsoil is being washed away. Determine how the sediment-laden water drains to a stream and what effect it may have on your water supply and on the people and towns farther downstream.

Visit the city's water supply plant. Where does the water come from? Does the water have to be treated before it can be used by people? Why?

Draw a map of a watershed showing cities, farms, forests, and recreation areas where conservation practices are needed and where they have been applied.

Show the different rates at which water soaks into three different kinds of soil.

Demonstrate how slopes and hills affect the way water runs off the land. Show some of the ways the water can be slowed down as it runs off a slope. Show how a hard rain splashes soil.

GRADE 5. Use of Natural Resources

OBJECTIVES

- To become aware of the way decisions about use of resources and energy by people affect the natural environment.
- To understand how the environment influences man's way of life and the kind of work he does.
- To understand some of the effects of natural and man-made changes in the environment.
- To understand how natural resources contribute to the industrial development of a nation.
- To understand how social and economic factors influence use and management of soil, water, air, plants, animals, and minerals.
- To learn how people plan and take action to conserve natural resources.

THINGS TO TALK ABOUT

How are living things changed as their environment changes? What are some historical examples of living things that could not adapt to their changing environment? Give some recent examples. In what ways did man bring about these changes?

How does man use science and technology in adapting to his environment? Have scientific discoveries changed your environment? Has agriculture or industry changed your environment? How?

What role has the environment played in influencing the way of life for a tribe of nomads? A fishing village? American Indians? A mining town? An industrial city? A farming community? Your community?

How do droughts, floods, fire, soil erosion, water and air pollution, and the construction of cities and highways affect plants? Animals? Man?

What is the relation of population growth to the quality of your environment?

What is the effect on people, animals, and plants when natural resources are abused, exhausted, improved? What happens to the economy? Society?

Name five sources of energy used by man. What impact has the use of, and search for, energy sources had on the industrial development of this country?

How does the price of wheat affect decisions to use or not to use conservation practices?

How does the price of minerals influence decisions on methods of mining and extent of land restoration?

How does the price of space in congested areas influence decisions affecting the environment?

What is the relationship between a country's natural resources and its industrial development?

How do soils differ? Why is soil information important to homeowners? Builders? Construction engineers? City planners? Foresters? Nurserymen? Insurance companies? Land appraisers?

What should people know about resource potentials and problems in their area? What are some of the laws and ordinances that affect use and management of natural resources in your community? Why are these laws necessary? How are local decisions and regulations affecting natural resources made?

How can you help improve your environment?

THINGS TO DO

Interview older people in your community to learn about changes in the local environment during their lifetime. Include such things as changes in number of people; land use changes; new industries and their impact; scientific and technological discoveries; and changes in transportation systems. What effect has each of these changes had on soil, water, animals, and people?

Make a month-long survey of local newspaper and magazine articles dealing with several aspects of natural resource use. Analyze these articles to identify major resource use problems and people's attitudes toward solving them. Did these attitudes intensify some of the problems?

Locate an area in which natural resources have deteriorated. Form small groups or committees to prepare reports detailing conservation needs. Outline a plan of action for improving the area.

Select a resource problem area on the school site or nearby and carry out a project, including application of a specific conservation practice, to improve the area.

Chart the industrial development of several states and identify the natural resources that contributed to this development. Indicate the original condition or supply of these resources and the present condition or supply.

Select a conservation organization or agency and prepare a report on its origin and its action programs that have had a lasting effect on some aspects of conservation in your community.

Visit a nearby public outdoor recreation area and sketch or photograph the various uses people are making of it. Find out who is responsible for maintaining the area and how much its use has increased in the last 5, 10, 15 years.

GRADE 6. Responsibility for Environmental Conservation

OBJECTIVES

- To understand man's responsibilities for use and management of his environment.
- To develop additional understandings of natural resources needed to apply conservation practices.
- To learn how different cultures relate to their environment.
- To learn how the natural environment serves as inspiration for creative art—painting, music, storytelling, and poetry—and how natural resources contribute to the production of materials used in painting, sculpture, and other art forms.
- To learn what local, state, and federal governments are doing to help protect and conserve natural resources.
- To understand the need to use ecological principles as guides for conservation action.

THINGS TO TALK ABOUT

What characteristics does man share with other living things? How does man's ability to plan and achieve objectives make him different from other living creatures?

What changes caused by man's use of resources have had or continue to have a detrimental effect on your environment? A beneficial effect?

What are man's responsibilities to other living things in making use of resources?

Discuss some of the ways primitive people use resources and contrast these with the ways a highly developed agricultural society and an industrial society use natural resources.

How do resources contribute to the social and economic development of our state, the nation, and the world?

How do some of the decisions on resource use in your community affect your state or the nation? What conservation practices can be used in your community to improve resources needed or used by other communities?

How might natural resources serve as themes in painting, music, dance, writing, or other creative work? What natural resources are used in the creation of art? What art materials are made from natural resources?

Discuss some ways architecture can be designed to harmonize with the natural setting of your community.

Have motion pictures changed ideas about natural beauty? What are some movies that have given you a better understanding of the environment?

Who makes the plans for the way in which your community develops? Who plans the use and management of water resources, land area developments, parks, and open spaces? How are these plans carried out? What government agencies are responsible for using and managing natural resources? Applying conservation practices in your community? In your state?

Discuss the place of producers, consumers, and decomposers in water, forest, and grass ecosystems. How might man's use of natural resources affect the soil, water, and air in relation to the equilibrium of an ecosystem? Identify ecological principles important to the use and application of conservation practices. Why must ecological principles be the base for designing and using successful conservation practices?

THINGS TO DO

Locate an eroding area on the school site or nearby and determine the probable cause or causes of the erosion. Design and carry out a plan to control the erosion and to prevent similar problems on the school ground in the future.

List the occupations of the parents of students in your class; determine the relation of each occupation to the use of natural resources.

Outline on a map of your community or county the boundaries of several watersheds; show how these watersheds form the drainage basin of a river.

Visit an art gallery or museum to learn how painters and sculptors use natural resources as inspiration for their works.

Listen to records or tapes that show how music can interpret the environment. Write a song that describes some aspect of the natural environment.

Sketch five buildings in your community that represent changes in architectural style and materials over the years.

Write a book report for class presentation to show how natural resources or the natural environment provided the inspiration, setting, or main theme.

Compile a list of local, state, and federal agencies with conservation and resource management responsibilities. Identify those that do conservation work in your community.

Attend a local planning meeting or public hearing where use of land, water, and other resources will be discussed; prepare a report on the proceedings.

Visit a state park, forest, wildlife refuge, or farm; report on the resource management objectives and procedures used to achieve them.

Study state legislation affecting natural resources and their use and management. Write a model ordinance that will help solve a specific resource use problem.

Make an inventory of the natural resources on your school site or on a nearby area; draw a map of the area to scale. Note the condition of these resources. On the basis of ecological principles, develop a conservation plan for using and managing the area; explain in detail the reasons for each conservation practice included in the plan.

GRADES 7 and 8. Making Choices in Conservation

OBJECTIVES

- To understand that the environment is a complex system and must be considered as an entity when modifying or managing any part of it for the needs of people.
- To understand how cultures relate to the natural environment in defining the values that influence choices in making use of resources and in determining how people meet environmental responsibilities.
- To develop attitudes that guide responsible personal decisions and behavior in the daily use and management of resources.
- To learn how communities, states, and nations use technical information about soil, water, and other natural resources in planning to meet the needs of people.
- To understand how man's use of natural resources depends on his knowledge of the resources and his ability to adapt to the capabilities and limitations of these resources within specific geographic locations.
- To become aware of the institutions and channels through which people as individuals or in groups can influence decisions that affect the public welfare in relation to resource management and conservation needs.

THINGS TO TALK ABOUT

Imagine the natural environment to be a huge jigsaw puzzle—what happens to the pattern when one piece is removed? Two or more pieces? How do conservation practices help keep all the pieces of the environmental complex functioning properly?

What factors should be considered in making decisions concerning long-term conservation management of a large park? A wildlife refuge? A cattle ranch? An industrial park?

What laws does our state have governing water quality? Land management? How are hunting and fishing laws enacted in our state? What are some significant national laws relating to conservation practices and to resource use and management?

What kinds of technical information on soil and water would city planners, water resource managers, and housing developers need to avoid permanent ecological disruption or economic waste? Identify specific technical information sources.

Discuss things you do every day that affect resource use. Name the purposes for which you use electric power? How many pounds of paper do you throw away in a week? In what ways does your family contribute to air pollution? Water pollution?

What are the conservation and environmental problems of your community? What treatments are needed? Why? How could the cost of water treatment in your community be reduced?

Does your community have a planning or zoning commission? What are the responsibilities of each? What are their criteria in planning for the use of land? Is land use based on soil capabilities?

What kinds of treatments are used in the disposal of sewage and solid wastes in your community? What effects do present treatment methods have on underground water supplies? Public health? Environmental quality? Do these methods contribute to air pollution? Water pollution?

THINGS TO DO

Make a conservation inventory of your community. Determine alternative solutions for several of the problems observed. Make sketches or use cameras and tape recorders when collecting data and presenting findings.

Develop an outdoor classroom for your school. Select an area with many different learning opportunities and make a map showing buildings, parking lots, athletic fields, trees, and other aspects of the landscape. Inventory the existing vegetation, boulders, streams, and special areas that could be used for learning. What kinds of technical information on soil and water management are needed? What kinds of plants are needed to encourage birds and small wildlife to make their homes in the outdoor classroom? Write a guidebook for a fourth-grade class explaining how to use the outdoor classroom in conservation studies.

Design a conservation-oriented science fair project, for example, measurements of soil moisture in relation to the hydrology of a watershed or the relationship of soil bacteria, nitrogen, and humus to living things on the soil surface.

Assume that all electric power has been cut off in your community for a week. Write a day-by-day account of the effects this would have on your life and on the life of the community.

Visit the sanitary landfill or other trash disposal site in your community. Write a report on the procedures used to dispose of waste and show how they affect water and land resources, air, public health, and esthetic qualities of your community. Sketches or snapshots might be used to illustrate the report.

Prepare an illustrated exhibit or report on international treaties regarding the protection of animal species, commercial fishing rights, pest control, and importation of plants and animals.

Read several books by different authors dealing with one resource or one aspect of resource use and compare and contrast the information given, manner of presentation, style of writing, and purpose.

Develop the objectives for a model organization of citizens who wish to cooperate in solving conservation problems. Compare the purposes and action programs of three local conservation organizations or groups.

Construct a simple, functioning ecosystem containing at least three different plants and two different animals. Record observations daily for at least a month.

How To Obtain Soil Conservation Service (SCS) Teaching Aids

To obtain SCS publications, maps, and other aids for teaching conservation, teachers may write, call, or visit local SCS offices. Listed in telephone directories under "United States Government," these offices now serve most counties in the United States. If there is no local office, teachers may obtain these aids by writing to State Conservationist, Soil Conservation Service, at the following addresses:

Wright Building
Post Office Box 311
Auburn, ALABAMA 36830

Severns Building
Post Office Box F
Palmer, ALASKA 99645

6029 Federal Building
230 North First Avenue
Phoenix, ARIZONA 85025

Federal Office Building
Room 5401
Little Rock, ARKANSAS 72201

Tioga Building, Room 203
2020 Milvia Street
Berkeley, CALIFORNIA 94704

2490 West 26th Avenue, Room 313
Denver, COLORADO 80211

Mansfield Professional Park
Route 44A
Storrs, CONNECTICUT 06268

Treadway Towers, Suite 2–4
9 East Loockerman Street
Dover, DELAWARE 19901

Federal Building
Post Office Box 1208
Gainesville, FLORIDA 32601

Heritage Building
468 North Milledge Avenue
Athens, GEORGIA 30601

440 Alexander Young Building
Honolulu, HAWAII 96813

304 North Eighth Street
Boise, IDAHO 83702

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200 West Church Street
Post Office Box 678
Champaign, ILLINOIS 61820

Atkinson Square—West, Suite 2200
5610 Crawfordsville Road
Indianapolis, INDIANA 46224

823 Federal Building
210 Walnut Street
Des Moines, IOWA 50309

760 South Broadway
Post Office Box 600
Salina, KANSAS 67401

1409 Forbes Road
Lexington, KENTUCKY 40505

3737 Government Street
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Alexandria, LOUISIANA 71301

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Orono, MAINE 04473

Hartwick Building, Room 522
4321 Hartwick Road
College Park, MARYLAND 20740

27–29 Cottage Street
Amherst, MASSACHUSETTS 01002

1405 South Harrison Road
East Lansing, MICHIGAN 48823

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316 North Robert Street
St. Paul, MINNESOTA 55101

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Federal Office Building
310 New Bern Avenue, Room 544
Post Office Box 27307
Raleigh, NORTH CAROLINA 27611

Federal Building
Post Office Box 1458
Bismarck, NORTH DAKOTA 58501

311 Old Federal Building
Third and State Streets
Columbus, OHIO 43215

Agricultural Building
Farm Road and Brumley Street
Stillwater, OKLAHOMA 74074

Washington Building
1218 SW Washington Street
Portland, OREGON 97205

Federal Building and U.S. Courthouse
Box 985
Federal Square Station
Harrisburg, PENNSYLVANIA 17108

U.S. Post Office
East Greenwich, RHODE ISLAND 02818

Federal Building
901 Sumter Street
Columbia, SOUTH CAROLINA 29201

239 Wisconsin Avenue, SW
Post Office Box 1357
Huron, SOUTH DAKOTA 57350

561 U.S. Courthouse
Nashville, TENNESSEE 37203

16–20 South Main Street
Post Office Box 648
Temple, TEXAS 76501

4012 Federal Building
125 South State Street
Salt Lake City, UTAH 84111

96 College Street
Burlington, VERMONT 05401

Federal Building, Room 7408
400 North Eighth Street
Post Office Box 10026
Richmond, VIRGINIA 23240

360 U.S. Courthouse
West 920 Riverside Avenue
Spokane, WASHINGTON 99201

209 Prairie Avenue
Post Office Box 865
Morgantown, WEST VIRGINIA 26505

4601 Hammersley Road
Post Office Box 4248
Madison, WISCONSIN 53711

Federal Office Building
Post Office Box 2440
Casper, WYOMING 82601

The Commonwealth of Puerto Rico also has an office; write to the Director, Caribbean Area, General Post Office Box 4868, San Juan, Puerto Rico 00936.

Soil Conservation Service Publications

Single copies of the SCS publications listed below are free to teachers:

Assistance Available from the Soil Conservation Service, AIB 345

Autumn Olive for Wildlife and Other Conservation Uses, L 458

Conservation and the Water Cycle, AIB 326

Controlling Erosion on Construction Sites, AIB 347

Early American Soil Conservationists, MP 449

Facts About Wind Erosion and Dust Storms on the Great Plains, L 394

Grass Makes Its Own Food, AIB 223

Grass—the Rancher's Crop, L 346

Know the Soil You Build On, AIB 320

Know Your Soil, AIB 267

Making Land Produce Useful Wildlife, FB 2035

Measure of Our Land, PA 128

More Wildlife Through Soil and Water Conservation, AIB 175

Mulches for Your Garden, H&G 185

Our American Land, AIB 321

Sediment: It's Filling Harbors, Lakes, and Roadside Ditches, AIB 325

Snow Surveys, AIB 302

Soil Conservation at Home, AIB 244

Soil Conservation Service, PA 818

Teaching Soil and Water Conservation: A Classroom and Field Guide, PA 341

Soil Erosion: the Work of Uncontrolled Water, AIB 260

Soil That Went to Town, AIB 95

That Land Down There, AIB 255

What Is a Farm Conservation Plan? PA 629

What Is a Ranch Conservation Plan? PA 637

What Is a Watershed? PA 420

Windbreaks for Conservation, AIB 339

SOIL CONSERVATION. This monthly magazine provides information on land and water conservation. It is useful to teachers and to students in grades 7 and above. Order by subscription from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. $2.00 per year.

Audiovisual Teaching Aids

Films, filmstrips, and slide sets dealing with different aspects of conservation are available to schools from many sources:

1. Some agencies of the federal government furnish films;

2. State departments of conservation and other state agencies often maintain libraries from which audiovisual teaching materials may be borrowed;

3. State film libraries usually located at land-grant colleges or universities have films and filmstrips; and

4. Industrial concerns and commercial producers of instructional materials provide films, filmstrips, transparencies, and slide sets.

Catalogs with annotated listings of films, filmstrips, and slide sets:

Films of the U.S. Department of Agriculture, AH 14. Motion Picture Service, Office of Information, U.S. Department of Agriculture, Washington, D.C. 20250. Single copy free. (Films can be purchased from the U.S. Department of Agriculture or borrowed from state film libraries. State library addresses included.)

Color Filmstrips and Slide Sets of the United States Department of Agriculture, MP 1107. Photography Division, Office of Information, U.S. Department of Agriculture, Washington, D.C. 20250. Single copy free. (These aids can be purchased from the U.S. Department of Agriculture.)

A Critical Index of Films and Filmstrips in Conservation. The Conservation Foundation and the Conservation Education Association. 100 pp., rev. 1971. $3.50. Orders to: Interstate Printers and Publishers, Inc., 19 North Jackson Street, Danville, Ill. 61832. (Includes the target audiences and the names and addresses of the organizations or agencies that sell, rent, and lend aids.)

Reading List for Children

Because all renewable natural resources are closely interrelated in a complex matrix, helping children to understand principles of resource conservation requires reading materials that deal with the many facets of resource use problems. So many stimulating books and bulletins for pupils and teachers are available today that no list can include all of them. The following publications are recommended for use in a teacher-pupil conservation library.

The prices quoted here are subject to change. Before ordering books, request a current price quotation from the publisher and ask about discounts to schools.

	Grade
Discovering Nature Series (three volumes listed). World Publishing Co., 110 East 59th Street, New York, N.Y. 10002.	1–3
At Home in Its Habitat: Animal Neighborhoods. Phyllis S. Busch. Illus., 1970. $4.50.	
From Field to Forest: How Plants and Animals Change the Land. Laurence Pringle. Illus., 1970. $4.50.	
Puddles and Ponds: Living Things in Watery Places. Phyllis S. Busch. Illus., 1969. $4.95.	
Good Rain. Alice Goudey. 26 pp., illus., 1950. $3.71. E. P. Dutton & Co., Inc., 201 Park Avenue South, New York, N.Y. 10003.	
True Book of Conservation. Richard Gates. 48 pp., illus., 1959. $3. Children's Press, Melmont Publishers, Inc., 1224 West Van Buren Street, Chicago, Ill. 60607.	1–3
World of the Living. Earl Ubell. 40 pp., illus., 1965. $3.25. Atheneum Publishers, 122 East 42nd Street, New York, N.Y. 10017.	1–3
Wild Young Desert. Ann Atwood. Illus., 1970. $4.95. Charles Scribner's Sons, 587 Fifth Avenue, New York, N.Y. 10017. Orders to: Shipping & Service Center, Vreeland Avenue, Totowa, N.J. 07512.	1-up
About the Land, the Rain, and Us. Terry Shannon. 32 pp., illus., 1963. $2.75. Children's Press, Melmont Publishers, Inc., 1224 West Van Buren Street, Chicago, Ill. 60607.	2–4
Arbor Day. Aileen Fisher. 36 pp., illus., 1965. $3.50. Thomas Y. Crowell Co., 201 Park Avenue South, New York, N.Y. 10003.	2–4
Follett Beginning Science Books (part of a series). Follett Publishing Co., 201 North Wells Street, Chicago, Ill. 60606.	2–4
Soil. Richard Cromer. 32 pp., illus., 1967. $1.25.	
Water. Philip B. Carona. 32 pp., illus., 1966. $1.25.	
Rivers. Delia Goetz. 64 pp., illus., 1969. $3.50. William Morrow & Co., Inc., Post Office Box 9169, Church Street Station, New York, N.Y. 10049.	2–4
Grasslands. Delia Goetz. 64 pp., illus., 1959. $3.36. William Morrow & Co., Inc., Post Office Box 9169, Church Street Station, New York, N.Y. 10049.	3–5
Green is for Growing. Winifred and Cecil Lubell. 64 pp., illus., 1964. $2.95. Rand McNally & Co., Post Office Box 7600, Chicago, Ill. 60680.	3–5
Water: Our Most Valuable Resource. Ivah Green. 99 pp., illus., 1958. $3.75. Coward-McCann, Inc., 200 Madison Avenue, New York, N.Y. 10016.	3–5
About Grasses, Grains and Canes. John Melvin Uhl. 48 pp., illus., 1964. $2.75. Children's Press, Melmont Publishers, Inc., 1224 West Van Buren Street, Chicago, Ill. 60607.	4–6
First Book of Conservation. F. C. Smith. 64 pp., illus., 1954. $3.75. Franklin Watts, Inc., 845 Third Avenue, New York, N.Y. 10022.	4–6
Our Friend the Forest: A Conservation Story. Patricia Lauber. 61 pp., illus., 1959. $3.50. Doubleday & Co., Inc., 277 Park Avenue, New York, N.Y. 10017. Orders to: 501 Franklin Avenue, Garden City, N.Y. 11530.	4–6
To Save the Soil. Naomi Talley. 79 pp., illus., 1965. $3.50. The Dial Press, Inc., 750 Third Avenue, New York, N.Y. 10017. Also available from: E. M. Hale & Co., Inc., Eau Claire, Wis. 54701, $2.61.	4–6
What is Soil? B. John Syrocki. 48 pp., illus., 1961. $1.80. Benefic Press, 10300 West Roosevelt Road, Westchester, Ill. 60153.	4–6
Dust Bowl: The Story of Man on the Great Plains. Patricia Lauber. 96 pp., illus., 1958. $3. Coward-McCann, Inc., 200 Madison Avenue, New York, N.Y. 10016.	4–8
Working Together for a Livable Land. 15 pp., cartoon booklet, 1970. 1–9 copies, $0.25 each; 10–99 copies, $0.12 each. Soil Conservation Society of America,	4–8

	Grade
7515 Northeast Ankeny Road, Ankeny, Iowa 50021. (Other cartoon booklets available at the same prices.)	
Amazing Seeds. Ross E. Hutchins. 159 pp., illus., 1965. $3.75. Dodd, Mead & Co., 79 Madison Avenue, New York, N.Y. 10016.	5–7
First Book of Water. F. C. Smith. 69 pp., illus., 1959. $3.75. Franklin Watts, Inc., 845 Third Avenue, New York, N.Y. 10022.	5–7
Discovering the Outdoors. Laurence P. Pringle, ed. 128 pp., illus., 1969. $3.95. The Natural History Press, Doubleday & Co., Inc., 277 Park Avenue, New York, N.Y. 10017. Orders to: 501 Franklin Avenue, Garden City, N.Y. 11530.	5–8
How a Law Is Made: The Story of a Bill Against Air Pollution. Leonard A. Stevens. 109 pp., illus., 1970. $3.95. Thomas Y. Crowell Co., 201 Park Avenue South, New York, N.Y. 10003.	5–8
Dust. Irving Adler. 122 pp., illus., 1958. $3.49. The John Day Co., Inc., 257 Park Avenue South, New York, N.Y. 10010.	6–8
Guide to Nature Projects. Ted S. Pettit. 316 pp., illus., 1966. $5.50. Grosset & Dunlap, Inc., 51 Madison Avenue, New York, N.Y. 10010.	6–8
Rain, Rivers, and Reservoirs: The Challenge of Running Water. Sellers G. Archer. 121 pp., illus., rev. ed. 1969. $3. Coward-McCann, Inc., 200 Madison Avenue, New York. N.Y. 10016.	6–8
This is Our Soil. Ernest D. Walker and Albert B. Foster. 56 pp., illus., paperback, 1951. $0.60. Interstate Printers & Publishers, Inc., 19 North Jackson Street, Danville, Ill. 61832.	6–8
Nature in the City. John Rublowsky. 152 pp., illus., 1967. $4.95. Basic Books, Inc., 404 Park Avenue South, New York, N.Y. 10016.	6-up
Shadows Over the Land. J. J. McCoy. 152 pp., illus., 1970. $4.95. Seabury Press, Inc., 815 Second Avenue, New York, N.Y. 10017.	6-up
Earth: The Stuff of Life. Firman E. Bear. 238 pp., 1962. $5.95. University of Oklahoma Press, 1005 Asp Avenue, Norman, Okla. 73069.	7-up
Ecology: Habitats, Niches, and Food Chains. Janet Nickelsburg. 128 pp., illus., 1969. $4.50. J. B. Lippincott Co., East Washington Square, Philadelphia, Pa. 19105.	7-up

	Grade
Land, People, and History. Elizabeth S. Helfman. 271 pp., illus., 1962. $4.95. David McKay Co., Inc., 750 Third Avenue, New York, N.Y. 10017.	7-up
Land Renewed: The Story of Soil Conservation. William R. Van Dersal. 160 pp., illus., rev. and enl. ed. 1968. $6. Henry Z. Walck, Inc., 19 Union Square West, New York, N.Y. 10003.	7-up
Nature and Science Library (part of a series). Natural History Press, Doubleday & Co., Inc., 277 Park Avenue, New York, N.Y. 10017. Orders to: 501 Franklin Avenue, Garden City, N.Y. 11530.	7-up
Air Around Us: Man Looks at His Atmosphere. T. J. Chandler. 156 pp., illus., 1969. $5.95.	
Conservation: Maintaining the Natural Balance. Joyce Joffe. 188 pp., illus., 1970. $6.95.	
Man, Nature, and History: Controlling the Environment. W. M. S. Russell. 252 pp., illus., 1969. $6.95.	
Man's Impact on Nature: Technology and Living Things. J. A. Lauwerys. 188 pp., illus., 1970. $6.95.	
Nature's Network: The Story of Ecology. Keith Reid. 188 pp., illus., 1970. $6.95.	
Origin of Cultivated Plants. Franz Schwanitz. 175 pp., illus., 1966. $4.75. Harvard University Press, Kittridge Hall, 79 Garden Street, Cambridge, Mass. 02138.	7-up
Origins of American Conservation. Henry Clepper. 193 pp., illus., 1966. $5. The Ronald Press Co., 79 Madison Avenue, New York, N.Y. 10016.	7-up
Plants That Changed the World. Bertha S. Dodge. 183 pp., illus., 1959. $4.50. Little, Brown & Co., 34 Beacon Street, Boston, Mass. 02106. Orders to: 200 West Street, Waltham, Mass. 02154.	7-up
Pond Life. George K. Reid. 160 pp., illus., paperback, 1967. $1.25. A Golden Nature Guide. Golden Press, Western Publishing Co., Inc., 1220 Mound Avenue, Racine, Wis. 53404.	7-up
Race Between Food and People. Charles R. Joy. 121 pp., illus., 1961. $3. Coward-McCann, Inc., 200 Madison Avenue, New York, N.Y. 10016.	7-up
Rivers and Watersheds in America's Future. Elizabeth S. Helfman. 244 pp., illus., 1965. $4.95. David McKay Co., Inc., 750 Third Avenue, New York, N.Y. 10017.	7-up

Grade

Sea Around Us. Rachel L. Carson. 237 pp., rev. ed. 1961. $6.50. Oxford University Press, 200 Madison Avenue, New York, N.Y. 10016. Orders to: 1600 Pollitt Drive, Fair Lawn, N.J. 07410. Also in paperback: $0.95. Signet Books, New American Library, Inc., 1301 Avenue of the Americas, New York, N.Y. 10019. — 7-up

Soil Conservation Service. D. Harper Simms. 238 pp., illus., 1970. $8.50. Frederick A. Praeger, Inc., 111 Fourth Avenue, New York, N.Y. 10003. — 7-up

Water and Life. Lorus and Margery Milne. 275 pp., illus., 1964. $5.75. Atheneum Publishers, 122 East 42nd Street, New York, N.Y. 10017. — 7-up

Water for People. Sarah R. Riedman. 151 pp., illus., rev. ed. 1961. $4.50. Abelard-Schuman, Ltd., 257 Park Avenue South, New York, N.Y. 10010. — 7-up

Wildlife for America. William R. Van Dersal. 160 pp., illus., rev. ed. 1970. $6. Henry Z. Walck, Inc., 19 Union Square West, New York, N.Y. 10003. — 7-up

Wonders of Water. James H. Winchester. (Wonders of Science Library Series.) 129 pp., illus., 1963. $3.29. G. P. Putnam's Sons, 200 Madison Avenue, New York, N.Y. 10016. — 7-up

World Provider: The Story of Grass. Sarah R. Riedman. 191 pp., illus., rev. ed. 1962. $3.95. Abelard-Schuman, Ltd., 257 Park Avenue South, New York, N.Y. 10010. — 7-up

Reading List for Teachers and Advanced Students

American Environment: Readings in the History of Conservation. Roderick Nash, ed. 236 pp., illus., paperback, 1968. $3.25. Addison-Wesley Publishing Co., Inc., Reading, Mass. 01867.

Approved Practices in Soil Conservation. A. B. Foster. 384 pp., illus., 3rd ed. 1964. $5 to schools. Interstate Printers & Publishers, Inc., 19 North Jackson Street, Danville, Ill. 61832.

Care of the Earth. Russell Lord. 384 pp., illus., paperback, 1962. $0.95. New American Library, Inc., 1301 Avenue of the Americas, New York, N.Y. 10019.

Careers in Conservation: Opportunities in Natural Resources. Henry Clepper, ed. 141 pp., illus., 1963. $4.50. The Ronald Press Co., 79 Madison Avenue, New York, N.Y. 10016.

Conserving American Resources. Ruben L. Parson. 544 pp., illus., 2nd ed. 1964. $10.25. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

Design with Nature. Ian L. McHarg. 197 pp., illus., 1969. $19.95. Natural History Press, Doubleday & Co., Inc., 277 Park Avenue, New York, N.Y. 10017. Orders to: 501 Franklin Avenue, Garden City, N.Y. 11530.

Different Kind of Country. Raymond F. Dasmann. 276 pp., illus., 1968. $5.95. Also in paperback: 1970. $1.95. The Macmillan Co., 866 Third Avenue, New York, N.Y. 10022.

Earth Day—The Beginning. Compiled and edited by the National Staff of Environmental Action. 233 pp., paperback, 1970. $1.25. Bantam Books, Inc., A National General Co., 666 Fifth Avenue, New York, N.Y. 10010.

Ecology. Eugene P. Odum. (Modern Biology Series.) 152 pp., illus., paperback, 1963. $3.25. Holt, Rinehart and Winston, Inc., 383 Madison Avenue, New York, N.Y. 10017.

Environmental Conservation. Raymond F. Dasmann. 375 pp., illus., 2nd ed. 1968. $8.95. Also in paperback: $4.95. John Wiley & Sons, Inc., 605 Third Avenue, New York, N.Y. 10016.

Face of North America: The Natural History of a Continent. Peter Farb. 316 pp., illus., 1964. $8.95. Young readers' edition (grades 7-up), $4.50. Also in paperback: 1968, Colophon Books, $1.95. Harper & Row, Publishers, 49 East 33d Street, New York, N.Y. 10016. Orders to: Scranton, Pa. 18512.

Field Trips: Ecology for Youth Leaders. Janet Nickelsburg. 120 pp., illus., paperback, 1966. $3. Burgess Publishing Co., 426 South Sixth Street, Minneapolis, Minn. 55415.

Forest and the Sea: A Look at the Economy of Nature and the Ecology of Man. Marston Bates. 277 pp., 1960. $6.95. Also in paperback: Vintage Books, $1.65. Random House, Inc., 201 East 50th Street, New York, N.Y. 10022. Orders to: Westminster, Md. 21157.

Integrating Conservation and Outdoor Education Into the Curriculum. William B. Stapp. 95 pp., illus., paperback, 1965. $2.60. Burgess Publishing Co., 426 South Sixth Street, Minneapolis, Minn. 55415.

Introduction to the Outdoors. Ben Osborn. 36 pp., 1965. $1. Audubon Naturalist Society of the Central Atlantic States, Inc., 1621 Wisconsin Avenue, NW, Washington, D.C. 20007.

Last Landscape. William H. Whyte. 376 pp., illus., 1968. $6.95. Also in paperback: Anchor Books, $1.95. Doubleday & Co., Inc., 277 Park Avenue, New York, N.Y. 10017. Orders to: 501 Franklin Avenue, Garden City, N.Y. 11530.

Living Earth. Peter Farb. 177 pp., illus., 1959. $4.95. Also in paperback: Colophon Books, $1.60. Harper & Row, Publishers, 49 East 33rd Street, New York, N.Y. 10016. Orders to: Scranton, Pa. 18512.

Man in the Web of Life. John H. Storer. 160 pp., paperback, 1968. $0.95. Signet Books, New American Library, Inc., 1301 Avenue of the Americas, New York, N.Y. 10019.

Natural Resources for U.S. Growth: A Look Ahead to Year 2000. Hans H. Landsberg. 260 pp., illus., paperback, 1964. $2.45. The Johns Hopkins Press, 5820 York Road, Baltimore, Md. 21218.

Nature and the American: Three Centuries of Changing Attitudes. Hans Huth. 250 pp., illus., 1957. $7.50. University of California Press, 2223 Fulton Street, Berkeley, Calif. 94720, or 25 West 45th Street, New York, N.Y. 10036.

People and Their Environment: Teacher's Curriculum Guide to Conservation Education. Matthew J. Brennan, ed. 8 vols., illus., 1968, 1969. $3.95 each; three or more vols.: $3.50 each. J. G. Ferguson Publishing Co., 6 North Michigan Avenue, Chicago, Ill. 60602.

Plants, Man, and the Ecosystem. W. D. Billings. (Fundamentals of Botany Series.) 160 pp., illus., paperback, 2nd ed. 1970. $3.50. Wadsworth Publishing Co., Inc., Belmont, Calif. 94002.

Politics of Conservation. Frank E. Smith. 338 pp., 1966. $7.95. Pantheon Books, Random House, Inc., 201 East 50th Street, New York, N.Y. 10022. Orders to: Westminster, Md. 21157.

Sand County Almanac: With Other Essays on Conservation from Round River. Aldo Leopold. 269 pp., illus., 1966. $7.50. Oxford University Press, 200 Madison Avenue, New York, N.Y. 10016. Orders to: 1600 Pollitt Drive, Fair Lawn, N.J. 07410. Also in paperback: 1970, $0.95. Sierra Club, Ballantine Book, Ballantine Books, Inc., 101 Fifth Avenue, New York, N.Y. 10003.

Silent Spring. Rachel L. Carson. 368 pp., 1962. $5.95. Houghton Mifflin, Co., 2 Park Street, Boston, Mass. 02107. Also in paperback: 1970, $0.95. Fawcett Publications, Inc., Fawcett Place, Greenwich, Conn. 06830. Orders to: 67 West 44th Street, New York, N.Y. 10036.

Soil Animals. Friedrich Schaller. (Ann Arbor Science Library Series.) 144 pp., illus., 1968. $5. Also in paperback: $1.95. University of Michigan Press, 615 East University, Ann Arbor, Mich. 48106.

Soils That Support Us. Charles E. Kellogg. 370 pp., illus., latest printing 1965. $6.95. The Macmillan Co., 866 Third Avenue, New York, N.Y. 10022.

Web of Life. John H. Storer. 144 pp., illus., 1953. $4.95. Devin-Adair Co., 1 Park Avenue, Old Greenwich, Conn. 06870. Also in paperback: $0.95. Signet Books, New American Library, Inc., 1301 Avenue of the Americas, New York, N.Y. 10019.

Where There is Life. Paul B. Sears. 224 pp., paperback, 1962. $0.75. Dell Publishing Co., 750 Third Avenue, New York, N.Y. 10017.

Wildlife Conservation. Ira N. Gabrielson. 244 pp., illus., 2nd ed. 1963. $5.95. The Macmillan Co., 866 Third Avenue, New York, N.Y. 10022.

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